

Circulating Tumor Cell Count

Circulating tumor cell (CTC) count identifies and quantifies the EpCAM protein produced by epithelial tumor cells. Testing should be done prior to the initiation of therapy and serially during treatment. CTC count may also aid in determining prognosis and in assessing treatment efficacy.

Disease Overview

Prognostic/Treatment Issues

- CTC count in whole blood is an independent predictor of progression-free survival and overall survival; cutoffs vary by tumor cell type
 - Metastatic breast cancer (MBC): >5 CTCs/7.5 mL of blood
 - Metastatic colorectal cancer (MCRC): >3 CTCs/7.5 mL of blood
 - Metastatic prostate cancer (MPC): >5 CTCs/7.5 mL of blood
- CTC count may indicate treatment efficacy
 - Baseline CTC count should be obtained before initiation of therapy
 - Serial CTC count testing may serve as a guide to therapy decisions and to assess prognosis

Tests to Consider

Circulating Tumor Cell Count 0093399

Method: Immunomagnetic Separation/Immunofluorescent Stain/Computer Assisted Analysis

May be useful in predicting prognosis and progression-free survival in patients with MBC, MCRC, and MPC and serve as an aid to evaluate and monitor response to therapy.

Median Overall Survival Based on CTC Count

	MBC (mos)	MCRC (mos)	MPC (mos)
CTC count < cutoff for all time points	22.6	18.6	>26
CTC count ≥ cutoff for all time points	4.1	3.9	6.8
CTC count ≥ cutoff at baseline and CTC < cutoff at final draw	19.8	11.7	21.3
CTC count < cutoff at early draw and CTC count ≥ cutoff at final draw	10.6	7.1	9.3

Miller, 2010¹

Physiology

EpCAM is expressed by MBC, MCRC, and MPC cells

- >5 CTCs/7.5 mL of blood in MBC
- >3 CTCs/7.5 mL of blood in MCRC
- >5 CTCs/7.5 mL of blood in MPC

Test Interpretation

Results

- Positive: ≥1 CTC/7.5 mL of whole blood (cutoff for prognosis is disease specific; see above)
- Negative: no CTCs detected



Limitations

- FDA approved only for MBC, MPC, and MCRC
 - The CellSearch CTC test kit must be used for specimen collection
 - CTC limit of quantitation is 0-500 cells
- CTC count should not be used alone to determine disease progression; use in conjunction with imaging
- In patients receiving doxorubicin therapy, allow at least 7 days following administration of a dose before collecting specimen
- Not detected
 - CTCs that do not express EpCAM
 - CTCs that express EpCAM but not cytokeratin 8, 18, or 19
- Serial CTC count should be performed by the same laboratory

References

1. Miller MC, Doyle GV, Terstappen LWMM. [Significance of Circulating Tumor Cells Detected by the CellSearch System in Patients with Metastatic Breast Colorectal and Prostate Cancer](#). J Oncol. 2010; 2010 617421. PubMed

Related Information

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